XVI. *On two new Genera of Land Tortoises. By Thomas Bell, Esq., F.L.S. Communicated by the Zoological Club of the Linnean Society.*

Read March 6, 1827.

In a monograph of the "Freshwater Tortoises having a moveable Sternum," published in the first volume of the *Zoological Journal*, I took occasion to remark, that it is in the genus *Terrapene*, and especially in those species which had been confounded by authors under the trivial name *clausa*, that we must look for the intermediate affinities by which the Freshwater Tortoises are connected with those which inhabit the land. These relations, however, are such as to constitute them a group of the family *Emydidæ* or true Freshwater Tortoises, notwithstanding their habits and structure approach in a certain degree to those of the *Testudinidæ* or Land Tortoises: and I sought in vain amongst the known species of the latter family for the slightest approach to such a similarity of structure as should point out a relation to the former.

About two years since, however, I obtained a living specimen of a new species of Tortoise (*Kinixys castanea* of the present communication), which appeared to possess in several particulars the relations of which I was in search. In the depressed form and remarkable lateral expansion of the shell, it exhibits an evident approach to the form of the shell in the genus *Emys*, whilst the size of the openings for the passage of the feet indicate an extraordinary facility and extent of motion. I find consequently,

sequently, that in accordance with this structure, its movements are by far more active than those of any other Land Tortoise I have seen; and that although the feet retain the clavated form belonging to the *Testudinidæ*, yet this is so much modified as to show a marked approach to the flattened, palmated conformation of those of the *Emydidæ*, whilst the claws are observed to assume somewhat of the length and sharpness which characterize the Freshwater family. These evident affinities to the latter group are remarkably strengthened by a peculiarity of structure in the *dorsum* or upper bony shell, which is divided into two portions, the posterior of which is moveable, and capable of being brought into actual contact with the posterior margin of the sternum, so as completely to protect the hinder feet and tail when they are withdrawn within the shell; or, by relaxing the muscles which had thus closed the box, to allow of its being opened to the extent of from one-half to three-fourths of an inch. This singular capability of motion is produced by the absence of any bony union between the fifth and sixth ribs, which are only connected by means of an elastic ligamentous substance. I have since become possessed of several shells of this species, in all the older specimens of which, that part of the inferior margin of the upper shell which is opposed to the edge of the sternum, is actually eroded by the force with which it has been continually brought into contact with it.

Although the situation of the hinge I have described, and the part to which the office is assigned of closing the shell, are different in the two groups, there is still, in the fact of a peculiar structure being formed for this specific purpose, a relation between them, which, conjointly with the other affinities of conformation to which I have alluded, appear to me to justify the view I have taken of them, as forming the two links by which the families are connected.

Some time after I had received the living specimen of which I have spoken, my friend Mr. J. E. Gray showed me two specimens of another species, very closely allied to the former, and having exactly the same peculiarity of structure. These were presented by Sir Everard Home to the British Museum, and have received from Mr. Gray the specific name of *Homeana*. I have now in my collection a third specimen of the latter species.

To the genus thus constituted, I have applied the name Kinixys, from *κινέω moveo*, and *ἴξυς lumbus*.

The other genus, which it is the object of this paper to describe, possesses also one peculiarity which is interesting in a similar point of view, as exhibiting a further affinity, or possibly only an analogical relation, to the Box Tortoises, although itself strictly belonging to the terrestrial family. From a careful examination of the Tortoises with a moveable sternum, and a comparison of them with every other group, I was convinced that wherever either of the transverse sutures of the bones composing the sternum is exactly adapted to the transverse division of the sternal scuta, there is no bony union of the two portions, and the moveable sternum consequently exists; and that such a structure could be thus ascertained, even in dried specimens, where the parts had become completely fixed.

This opinion I was led for a time to consider erroneous, in consequence of examining the shell of a new species of Tortoise, evidently of the terrestrial form, and belonging therefore to the *Testudinidæ*. This specimen had lost the anterior lobe of the sternum; and from the appearance of the fracture, it was obvious that the suture of the bone and the junction of the humeral and pectoral plates had existed exactly at the same line: and as no such structure as that of a moveable portion of the sternum had ever been found to belong to any Tortoise of a similar general conformation, I believed that this fact was probably fatal to

Fig 1

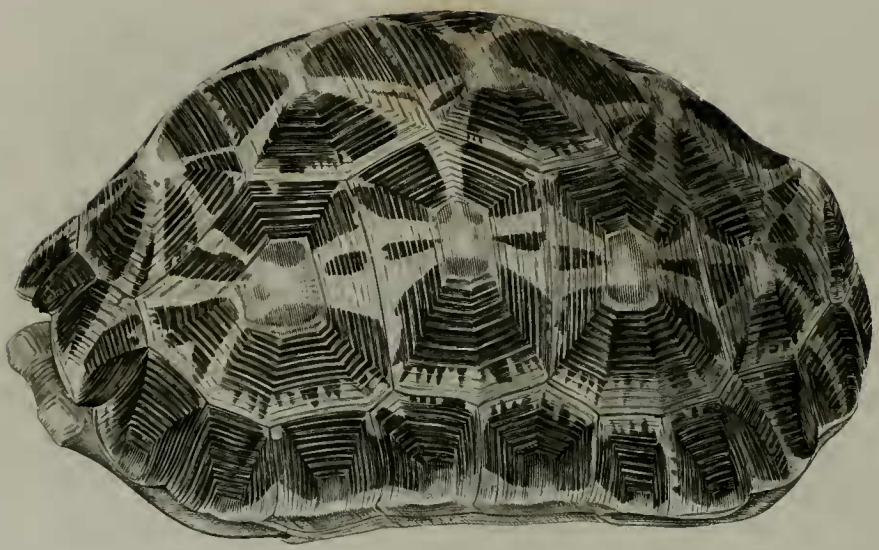
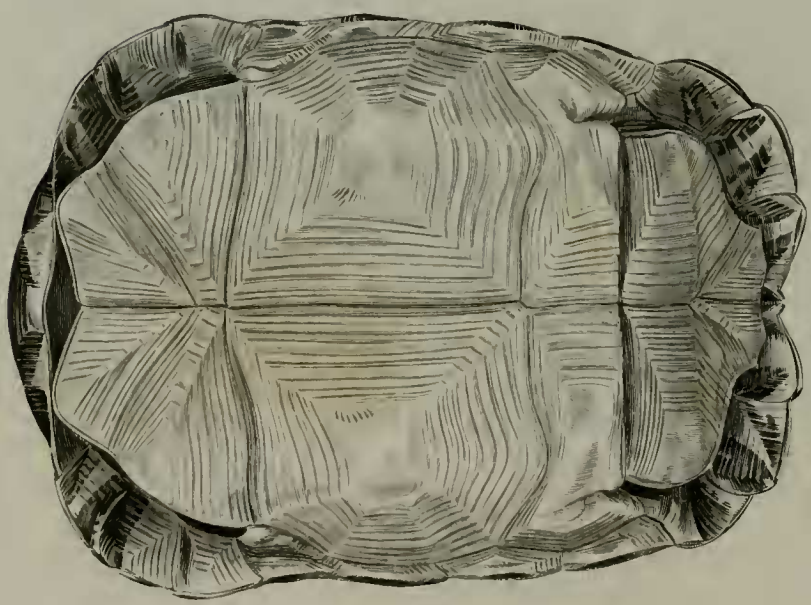


Fig 2



Pyxis arachnoides

to my former theory. The possession at length of a specimen of the same species, in which the sternum was uninjured, confirmed its truth, however, by exhibiting a perfect *land* Tortoise with the anterior lobe of the sternum moveable, and capable of as accurately closing the shell, as in any species of the fresh-water Box Tortoises.

This peculiarity, so unexpected in the Land Tortoises, appears to be sufficiently important, connected as it is with a remarkable modification of the muscular system, to require a distinct generic appellation, which I propose to supply by the name Pyxis.

The importance of such species as form a passage from one group to another, and the affinities of which serve to indicate the relations whereby the different groups are connected, will perhaps be a sufficient excuse for my having dwelt so long on the minute circumstances connected with the history of those species which form the subject of this paper; especially when it is considered, that in the present instance they fill up a *hiatus* which has long interfered with a perfect knowledge of the natural arrangement of the order.

Ordo. Testudinata, *Merrem.*

Fam. Testudinidæ.

Genus. PYXIS.

Pedes clavati?
Testa gibba.
Sterni lobus anterior mobilis, ligamento articulatus.

Pyxis arachnoïdes. Tab. XVI. Fig. 1. 2.

Habitat ——?
Mus. nostr.

De-

Description. *Shell* gibbous, ovate, emarginate before, slightly expanded over the hinder feet. *Scuta* striated, black, with a few broad yellow radiations, which are narrower at the area, increasing in breadth towards the circumference; in many of them a dentated yellow margin. The first *vertebral scutum* pentagonal, broader than it is long, the lateral margins parallel, anteriorly truncate; the second, third, and fourth hexagonal; the fifth irregularly quadrilateral: the first *costal scutum* trapezoidal, very irregular; the second and third pentagonal; the fourth quadrate: *marginal scuta* 24, consisting of 11 pairs, and an anterior and posterior single one; the anterior small, linear, emarginate at the apex; the posterior very broad, quadrate, inflexed. *Sternum* of an uniform yellow colour, nearly as long as the upper shell, and very broad; the *anterior lobe*, which is covered by the *gular** and *humeral scuta*, slightly emarginate, very moveable, connected with the body of the sternum by a ligament, and capable of entirely closing the anterior opening of the shell; when closed, the margin is considerably within that of the upper shell: the abdominal portion of the *sternum* very large; the *sterno-costal suture* extending from the fourth to the seventh pairs of marginal scuta inclusive; the anterior margin of the *pectoral scuta* overlapping the posterior margin of the *humeral*, so as to conceal the joint: the posterior lobe of the *sternum* broad

* In order to avoid unnecessary repetition, and to render descriptions of these animals more intelligible by a fixed nomenclature, I have applied to the six pairs of sternal scuta the following names, expressive of their relative situation with regard to the different parts of the animal. The first pair I have termed *gular*, the second *humeral*, the third *pectoral*, the fourth *abdominal*, the fifth *femoral*, the sixth *caudal*. Of the two pairs of scuta situated at the junction of the sternum with the upper shell,—I have assigned to the anterior the name of *post-humeral*, and to the posterior that of *ante-femoral*.

and

and short; the *caudal scuta* truncate, in contact with the upper shell, excepting a slight emargination for the passage of the tail; the spaces for the hinder legs very small and contracted.

As I have only seen the shell of this species, I am unfortunately obliged to confine the description to that part.

I have in my collection two specimens of this Tortoise, which differ considerably from each other both in colour and form. In one, the ground-colour of the upper shell is deep black, the radiations of a bright clear yellow, and the sternum of a light yellow: the areæ of the dorsal scuta are quite flat, and the hinder part of the back somewhat depressed. In the other, the ground-colour is of a deep blackish-brown, the radiations very obscure, and the sternum of a brownish-yellow colour, the anterior lobe being the darkest part: the dorsal scuta are elevated in the centre, and the back is everywhere evenly rounded, forming nearly a semicircular outline. Notwithstanding these points of dissimilarity however, which give at first sight a strikingly different appearance to the two specimens, the essential characters both of marking and of structure are sufficiently preserved to identify them as individuals of the same species.

Dimensions.	Inches.	Lin.
Length of the upper shell, following the curvature	7	0
Length in a direct line	5	0
Breadth, following the curvature	6	3
Circumference	10	0
Lateral diameter	3	6
Vertical diameter	2	5
Length of the sternum	4	6
Length of the moveable lobe	1	2
Breadth of ditto at its articulation	2	0

Genus.

Genus. KINIXYS.

Pedes subclavati.

Testa expansa, subdepressa.

Dorsi pars posterior mobilis.

Spec. 1. Kinixys castanea. Tab. XVII. Fig. 1.

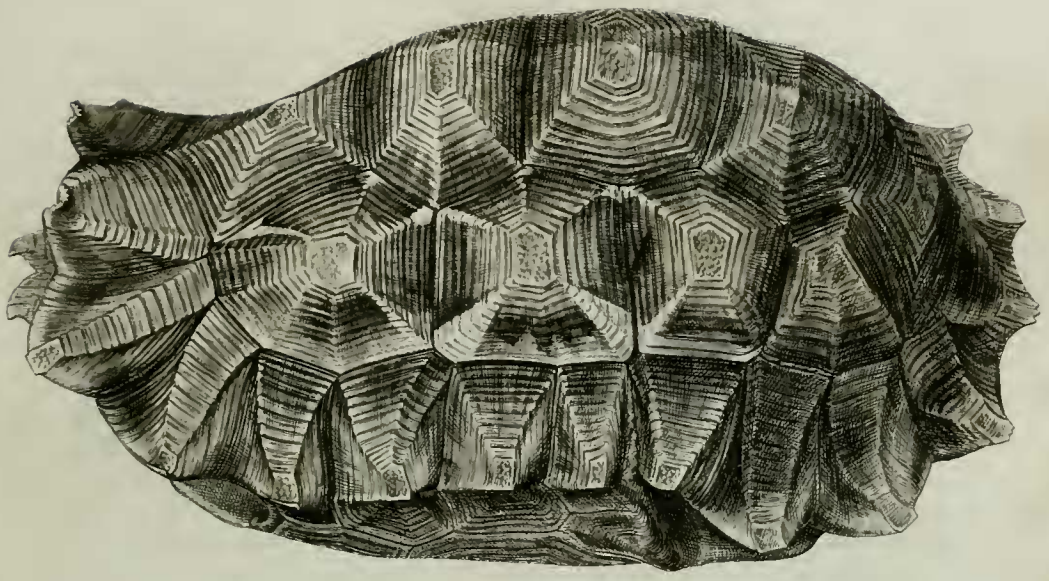
Sterno anticè ultra testam superiorem prominente; scutis marginalibus 23.

Habitat in Africâ.

Mus. nostr.

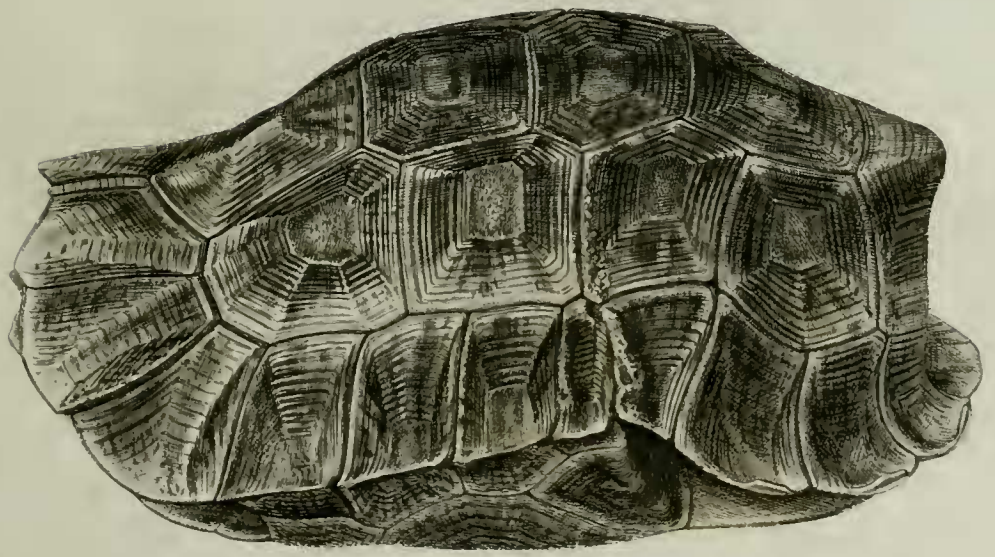
Description. *Head* rather long, somewhat depressed. *Feet* compressed, less clavated, and the toes more distinct than in the other species of the family. *Shell* of a rich chestnut-brown colour, the older specimens having patches of yellow principally towards the lower margin of the costal scuta; broad-ovate, rounded and gibbous posteriorly, the anterior and posterior margins projecting and somewhat reflected: the marginal outline deeply denticulated. *Dorsal scuta* strongly marked with concentric striæ, and a raised line in the direction of each angle, radiating from the area: the *vertebral scuta* slightly carinated; the first pentagonal, the anterior angle acute, the area having a sharp ridge; the second, third, and fourth hexagonal; the fifth gibbous, quadrangular, the base very broad, and forming the segment of a circle: the first *costal scutum* trapezoidal, elongated, the inferior margin rounded; the second and third pentagonal; the fourth trapezoidal. *Marginal scuta* 23; viz. 11 pairs, and a posterior single one; the anterior ones turned up at the areæ, which are marginal, and have somewhat the appearance of being eroded; the lateral and posterior hollowed; the margin raised, projecting, and with the areæ reflected. The moveable hinge or joint commences immediately

Fig. 1.



Kinixys castanea

Fig. 2.



Kinixys Homeana